LIBRARY

BOSTON
UNIVERSITY

COLLEGE
of
BUSINESS
ADMINISTRATION

Class No. * 352.1
Book No. D89
Acc. No. 23573
Date 6-19-35

Digitized by the Internet Archive
in 2014

https://archive.org/details/taxprobleminnewe00dumo

BOSTON UNIVERSITY

College of Business Administration

THESIS

THE TAX PROBLEM IN A NEW ENGLAND COMMUNITY (WELLESLEY)

by

William Edward Dumont
(B. S. in B. A. Boston University 1934)

submitted in partial fulfillment of
the requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

1935

6/19/35
23573
* 35-2.1
D 89 cop.1

PREFACE

In the last few years an increasing sense of indignation at the inequitable distribution of the municipal tax burden has motivated tax investigations. However, little conclusive evidence has been forthcoming as to the inequalities to be found in the relationship of personal property and real estate values.

That this work is objective and almost entirely statistical is obvious. Its value depends on the establishment of the relationships of personal property to real estate and land to improvements. Of more value, perhaps, is an estimate of the loss of valuation and revenue due to faulty assessment of personalty. In this faulty assessment may be found the answer to inequitable distribution of tax burdens.

The writer wishes to acknowledge his indebtedness to Professor William G. Sutcliffe of Boston University, who suggested the value of this study and who so kindly guided this work through to its completion.

To Mrs. Warren S. Warner the writer is under obligation for aid in the compilation and arrangement of the frequency tables.

William E. Dumont

Marlborough, Massachusetts
February, 1935

TABLE OF CONTENTS

Preface Page i

PART I

Introduction Page 1

Statement of the Problem 3

Statistical Methods Used 5

Definitions of Terms 8

PART II

Body of Thesis (Tables and Graphs) Page 12

Frequency Tables:

Personal Property to Real Estate 16-19

Land to Improvements 21-24

Averages 25

Correlation 35

Sources of Revenue 38

Distribution of Revenues 39

Valuations, Appropriations, and Debt 41

Ratio of Assessment and Tax Rate 42

Valuations, Appropriations, and Debt--Graph 43

Details of Valuation 45

Details of Valuation--Graph 46

TABLE OF CONTENTS

Preface Page i

PART I

Introduction Page 1
Statement of the Problem 3
Statistical Methods Used 5
Definitions of Terms 8

PART II

Body of Tests (Tables and Graphs) Page 12
Frequency Tables:
Personal Property to Real Estate 10-12
Land to Improvements 83-84
Average 28
Correlation 30
Sources of Revenue 30
Distribution of Revenue 30
Valuations, Appropriations, and Debt 41
Ratio of Assessed and Tax Rate 42
Valuations, Appropriations, and Debt--Graph 43
Details of Valuation 45
Details of Valuation--Graph 46

TABLE OF CONTENTS (continued)

PART III

Conclusions Page 47

Correlation of Personal Property to Real Estate 48

Correlation of Land to Improvements 50

Loss of Revenue from Personalty Valuation 52

Inequitable Distribution of Tax Burden 55

Restatement 56

PART IV

Bibliography Page 58

PART I

INTRODUCTION

"By far the most significant of recent developments in the field of American taxation is the new temper of the taxpaying public. This new temper scarcely requires statistical demonstration. Its day to day manifestations are amply recorded in the public press. Among these manifestations may be mentioned the birth of hundreds of new taxpayers' associations, the resolutions and activities of farm and trade organizations, the multiplication of tax investigation bodies, both public and private, and the growing volume of reports, studies and recommendations which represent the results of their findings. The new mood of the taxpayer is reflected in the current platforms of candidates for political office, in the long drawn out and acrimonious sessions of legislative bodies and in the wave of budget slashing which has lately become epidemic.

"The particular conditions which are responsible for the prevailing state of mind as regards matters of taxation are doubtless manifold and diverse. Most tax grievances, however, are in the final analysis reducible to one or the other of two basic complaints. The tax burden, taken in the aggregate, may be conceived

to be excessive, or the distribution of the total burden as between various individuals, classes and productive activities, may be found at fault. Whether or not the taxpayer of today has more cause for complaint on either of these counts than he did formerly, the fact remains that considerable changes have taken place both in the aggregate burden of taxation and in the manner of its apportionment within the last fifteen or twenty years."(1)

Statement of the Problem

The statement of Clarence Heer, quoted above from Recent Social Trends, gives the reader a broad perspective of the general trend in taxation. Of the two basic complaints: (1) an excessive aggregate tax burden, (2) an inequitable distribution of the total burden, we are concerned primarily with the second grievance.

For some years legislators, city officials, and taxpayers have known that the burden of municipal finance is borne by the real estate owner. To what

---

(1) Clarence Heer, TRENDS IN TAXATION AND PUBLIC FINANCE, Recent Social Trends, Volume II, Page 1331.

extent this condition prevails has been suppositional. It is known that the personal property holder profits at the expense of the real estate owner. How grave is this situation? Suffice it to say that as recently as December 31, 1934, Mayor Mansfield of Boston stressed the need for remedying the condition. In a statement to the Board of Assessors, he demanded a closer scrutiny of personal property this year by the assessors in an effort to obtain more taxes from this source.

"The personal property holder has been getting by for years without paying his share of the freight. The owners of real estate have reached their limit and the personal property holder ought to pay his share of the burden of government. The efforts of the assessors should be directed towards careful and equal assessments, and to obtain as much additional revenue from the assessment of personal property as possible.

"Since 1929 when the peak was reached on real estate values, there have been reductions on the valuation of real estate amounting to $351,000,000. It may be that these reductions have reached the low-water mark, and if so the efforts of the assessors from this time on should be towards an equalization of values.

"Give special attention to the taxation of tangible personal property to the end that real estate may not be unjustly burdened because of neglect in the taxing of other property which under existing laws is liable for and should pay its proper and proportionate share of the cost of government.

"The taxpayers also should be encouraged to file with the assessors a list of the tangible personal property on hand, January 1. To the extent of the taxpayers co-operating with the assessors will be measured the equality and fairness with which the tax burden can be spread."(1)

The personal property holder should stand his proportionate share of the expense. That he does not and has not is manifest. The discovery of the extent to which this condition prevails is the purpose of this work. We are interested primarily, therefore, in the relationship of personal property values to real estate values.

Statistical Methods Used

The collection of data for this study has been confined of necessity to the assessment lists and

---

(1) STATEMENT BY MAYOR MANSFIELD, The Boston Herald, January 1, 1935, Page 16.

financial statements of the Town Reports of Wellesley, Massachusetts. Wellesley was selected for this analysis because of the almost complete homogeneity of the property within its borders. The town is predominantly residential--there are no large industrial companies or commercial enterprises whose holdings of real estate and personal property would have a tendency to affect the results. We are naturally most interested in the effects upon the home owner in such a study as this; and the more nearly residential a town is the more accurate and more valuable will be the conclusions.

Personal property, for the purpose of this study, has been compared to total real estate held by an assessee. Total real estate includes all land and improvements owned by any real estate holder. To clarify the method let us take a supposed assessment:

Doe, John J.	
Personal Property	$ 3,500
House	10,000
Garage	2,000
Land	1,000
House	25,000
Garage	5,000
Land	6,000

This would appear on the frequency table, Personal Property to Real Estate, as: Personal Property $3,500; and

Real Estate $49,000. We are interested in the relationship of personal property to total real estate, for from that relationship may be drawn some idea as to the amount of taxable property which is not being assessed. From this relationship, too, we may draw some conclusion as to the inequitable distribution of the tax burden.

Real estate, in the second group of frequency tables, has been broken down to compare the improvements upon a particular piece of land to the value of that land. Where an assessee owns more than one piece of real estate, therefore, we have not totaled separately the land and the improvements with a comparison made from the resulting figures. We need a finer comparison than this would afford. Each piece of land with its improvements appears as a separate frequency. Taking the assessment from above, we may understand the method used.

This would appear on the frequency table, Land to Improvements, as: Land, $1,000 and Improvements, $12,000; again as: Land $6,000 and Improvements $30,000 giving us two classifications under one assessment. We are obviously interested to see whether as improvement values increase, land values increase proportionately.

Are high land values used for the more valuable pieces of property?

Certain other tables and figures have been included because, although largely self-explanatory, they do at the same time give us a more complete picture of the situation.

Definitions of Terms

At the outset, it might not be amiss to define some of the terms used. Correlation, means, and medians have little significance for the uninitiated who, to use this study intelligently, should have an idea of what these expressions mean.

"Real estate means in general land (in its broadest sense), all buildings and other structures permanently attached to the land, and such equipment, machinery, etc., as is so definitely attached to a building that it could not be removed to another location without serious impairment of its value or use, such as elevators, fire escapes, shafting for machinery, etc."(1)

---

(1) Fred R. Fairchild, and others, ELEMENTARY ECONOMICS, Volume II, Page 382.

"Personal estate or personal property or personalty means all possessions except real estate. Personal property is divided into two classes: (1) tangible personal property, being that which has a physical substance, such as machinery, household furniture, jewelry, etc., and (2) intangible personal property, which includes all other personalty; that is, abstract rights against wealth in the physical possession of others or against other persons, such as promissory notes, corporation stocks, bank deposits, etc."(1)

Frequency Table -- "A frequency table is the recording into homogeneous groups, arranged in ascending order, the occurrence of various measurements of certain phenomena which are measured at one definite period of time. The groups into which the data are recorded are called 'class intervals', and the number of occurrences in any one class constitutes its frequency. The total of all frequencies constitutes the distribution of the entire series and is termed 'total frequency', or 'population'."(2)

---

(1) Fred R. Fairchild, and others, ELEMENTARY ECONOMICS, Volume II, Pages 382-383.
(2) William G. Sutcliffe, ELEMENTARY STATISTICAL METHODS, Pages 91-92.

Mean -- "The arithmetic mean of a series is the measurement of that variable which divides the data in such a way that the sum of the deviations (in units of measurement) of all data from the mean equals zero. In other words, it is the result obtained by dividing the sum of the measurements of all the variables by their number."(1)

Median -- "The median is that position on the scale, which divides the items, when arranged in ascending order, in such a way that there are as many above as below the central position."(2)

Quartiles -- "The quartiles divide the total frequency of a series into four equal parts: the first, second, third, and fourth quartiles. As their terms indicate, they are of the same species as the median."(3)

Mode -- "The mode is the measurement of the item of greatest frequency."(4)

Correlation -- "When two quantities are so related that the fluctuations in one are in sympathy

---

(1) William G. Sutcliffe, ELEMENTARY STATISTICAL METHODS, Page 135.
(2) Ibid., Page 149.
(3) Ibid., Page 153.
(4) Ibid., Page 156.

with the fluctuations of the other, so that an increase or decrease of one is found in connection with an increase or decrease (or inversely) of the others, and the greater the magnitude of the change of the one the greater the magnitude of the change in the other, the quantities are said to be correlated."(1)

"Correlation may be briefly defined as the tendency toward concomitant variation, and the so-called correlation coefficient is simply a measure of such tendencies more or less adequate according to the circumstance of the case."(2)

Probable Error -- "The probable error gives the limits within which the coefficient of correlation may be said to fluctuate owing to the possibility of defective sampling."(3)

Stress is laid upon correlation and its measure, the coefficient of correlation, because of its importance in the determination of relationship between two series. It must be stated here that its measures in order to be significant should be at least six times its probable error and have a minimum value of 0.5.

---

(1) William G. Sutcliffe, ELEMENTARY STATISTICAL METHODS, Page 194, quoted from: A. L. Bowley, Elements of Statistics, Page 316.
(2) Ibid., Page 194, quoted from: W. Brown, The Essentials of Mental Measurement, Page 42.
(3) Ibid., Page 218.

PART II

BODY OF THESIS

Frequency Tables

Personal Property to Real Estate

The following frequency tables: Personal Property to Real Estate and Land to Improvements have been drawn up from the assessment lists of Wellesley, Massachusetts. Reference has been made to the methods used in arriving at the different classifications for both sets of tables.(1)

The tables for Personal Property to Real Estate are important because from them definite conclusions as to the relationship between these two types of property have been drawn. Attention should be called to the concentration of Personal Property in the lower class intervals. This concentration results in a freak distribution of the frequencies, a low coefficient of correlation, and the inequitable distribution of property taxes.

The tables for Land to Improvements show a far more orderly arrangement of frequencies. This same division of property into a semblance of mathematical allignment gives a consequent coefficient of correlation which has some significance. The interesting figure in

---

(1) Confer ante, Page 5.

these tables is that which shows the relationship of unimproved land to the total parcels of land.

If the reader will compare both sets of tables, Personal Property to Real Estate and Land to Improvements, he will notice a marked similarity in the groupings for all four years. In fact, this same similarity is the reason for drawing all conclusions from the figures for 1933. In the use of ratios, each ratio has been checked with same figure for the years: 1930, 1931, and 1932. They were always the same; and consequently the year 1933 has been referred to that the absolute figures might be brought as near to the present as possible.

Table I

Personal Property to Real Estate

(1930)

Real Estate

Personal Property

	None	Under 500	500 - 1000	1000 - 1500	1500 - 2000	2000 - 2500	2500 - 3000	3000 - 3500	3500 - 4000	4000 - 4500	4500 - 5000	5000 - 5500	5500 - 6000	6000 - 6500	6500 - 7000	7000 - 7500	7500 - 8000	8000 - 8500	8500 - 9000	9000 - 9500	9500 - 10000	10000 - 11000	11000 - 12000	12000 - 13000	13000 - 14000	14000 - 15000	15000 - 20000	20000 - 25000	25000 - 30000	30000 - 35000	35000 - 40000	40000 - 45000	45000 - 50000	Over 50000	Totals
None		393	96	58	60	71	57	71	101	98	105	119	106	110	92	73	68	63	49	51	64	69	46	39	30	25	85	32	26	21	5	11	2	39	2335
Under 500	66				1	1			2				3	5	3	2	11	7	7	4	5	22	10	9	13	3	9	3			1			2	189
500 - 1000	32					1				1					1			9	13	15	19	26	27	12	9	5	20	14	7	4	2			1	218
1000 - 1500	21								1			1	2	1						2		10	22	11	19	15	30	13	3	1	2	2		2	161
1500 - 2000	9												1				1						1	1		4	29	9	6	2	1	2		2	68
2000 - 2500	11							1																			17	19	11	1	1	1	1		66
2500 - 3000	1																								1		1	7	4	1	2	2		1	20
3000 - 3500	2											1														1	1	8	6	1	1	1	1	2	25
3500 - 4000	3																												4					1	8
4000 - 4500	3													1													1		5	1	2			1	14
4500 - 5000																				1										1				2	4
5000 - 5500	2																							1							1				4
5500 - 6000																																		1	1
6000 - 6500	2																												1					2	5
6500 - 7000																																			
7000 - 7500	2																1																		3
7500 - 8000																																			
8000 - 8500	1																																		1
8500 - 9000																				1															1
9000 - 9500																																		2	2
9500 - 10000																																			
10000 - 11000																																		3	3
11000 - 12000	1																																	1	2
12000 - 13000																																			
13000 - 14000														1																					1
14000 - 15000																																			
15000 - 20000	1																							1									1	1	4
20000 - 25000	1																																		1
25000 - 30000																																		1	1
30000 - 35000																																			
35000 - 40000																																			
40000 - 45000																																		1	1
45000 - 50000																																		1	1
Over 50000	4																																	1	5
Totals	162	393	96	58	61	73	57	72	104	99	105	121	112	118	96	75	81	79	69	73	89	127	106	74	72	53	193	105	73	39	17	20	5	67	3144

Table II

Personal Property to Real Estate

(1931)

Real Estate

Personal Property

	None	Under 500	500-1000	1000-1500	1500-2000	2000-2500	2500-3000	3000-3500	3500-4000	4000-4500	4500-5000	5000-5500	5500-6000	6000-6500	6500-7000	7000-7500	7500-8000	8000-8500	8500-9000	9000-9500	9500-10000	10000-11000	11000-12000	12000-13000	13000-14000	14000-15000	15000-20000	20000-25000	25000-30000	30000-35000	35000-40000	40000-45000	45000-50000	Over 50000	Totals
None		340	92	62	64	65	55	63	82	94	107	100	109	102	105	88	62	67	39	47	59	73	53	86	24	22	80	35	23	17	6	7	6	31	2215
Under 500	65		1				2	2	1	2			3	1	3	3	9	12	11	1	5	19	19	10	11	4	14	6	1		1	1		1	220
500 - 1000	21					1	1			1			1		1		1	8	15	16	24	23	22	13	12	1	22	18	1	2		1		3	220
1000 - 1500	16								1			1	1	1				1	23			8	23	9	19	18	35	12	1	1	2	1		1	164
1500 - 2000	5																1	1				1		2	1	5	26	13	8	2	1	1	5	2	70
2000 - 2500	5							1						1													18	16	9	4	2	2	2	1	61
2500 - 3000	1													1								1		1			3	6	1		4		1	1	20
3000 - 3500																	1									1	1	12	10	2	1			2	30
3500 - 4000	3																						1					1	5	1				1	12
4000 - 4500	2																									1		1	2	2			1	14
4500 - 5000	1																		1								1		1				2	6
5000 - 5500																							1							1	1			3
5500 - 6000																																	1	1
6000 - 6500	1																																3	6
6500 - 7000																																		
7000 - 7500	3																1																1	3
7500 - 8000																																		
8000 - 8500																										1								
8500 - 9000																										1								1
9000 - 9500																																	2	2
9500 - 10000																																		
10000 - 11000	1																																3	4
11000 - 12000	1																							1									1	3
12000 - 13000																																		
13000 - 14000														1																				4
14000 - 15000																																		
15000 - 20000	2																						1										2	5
20000 - 25000	1																																	1
25000 - 30000																																	1	1
30000 - 35000																																		
35000 - 40000																																	1	1
40000 - 45000																																		
45000 - 50000																																	1	1
Over 50000	2																																1	3
Totals	128	340	93	62	64	66	58	66	84	97	107	101	114	110	109	91	75	89	65	71	88	125	118	73	68	57	201	120	76	37	20	17	10	66	3066

Table III

Personal Property to Real Estate

(1932)

Real Estate

Personal Property

	None	Under 500	500-1000	1000-1500	1500-2000	2000-2500	2500-3000	3000-3500	3500-4000	4000-4500	4500-5000	5000-5500	5500-6000	6000-6500	6500-7000	7000-7500	7500-8000	8000-8500	8500-9000	9000-9500	9500-10000	10000-11000	11000-12000	12000-13000	13000-14000	14000-15000	15000-20000	20000-25000	25000-30000	30000-35000	35000-40000	40000-45000	45000-50000	Over 50000	Totals
None		353	98	70	66	68	58	64	82	99	114	110	118	120	116	89	77	64	49	52	65	88	57	41	35	27	93	41	19	15	6	7	5	27	2393
Under 500	79		1		1		2	1	1	1		1	2	3	1	4	8	16	7	8	8	19	18	10	14	1	17	4	5	1	1			2	236
500 - 1000	20					1				1		1		1				8	15	15	24	23	22	12	8	4	25	20	9	2				2	213
1000 - 1500	19			1					1				2	1				1	1			17	22	16	20	22	30	10	1	6	1	1	1	4	175
1500 - 2000	8		1					1																1	2	7	25	12	8	1		1	1	4	69
2000 - 2500	4							1		1																	26	17	6	6		3	1		65
2500 - 3000	1													1									1				1	5	4		3	1		1	18
3000 - 3500	3																									1		13	11	2	1	1		1	33
3500 - 4000	3																											1	4	1			1	4	11
4000 - 4500	2																												5	2	1			2	12
4500 - 5000																				1										1				2	4
5000 - 5500																							1					1			1	1		1	5
5500 - 6000																																		1	1
6000 - 6500	1																			1														3	5
6500 - 7000																																			
7000 - 7500	1																1																	1	3
7500 - 8000																																			
8000 - 8500	1																																		1
8500 - 9000																																			
9000 - 9500	1																																	2	3
9500 - 10000																																			
10000 - 11000	1																																	2	3
11000 - 12000																								1										1	2
12000 - 13000																							1												1
13000 - 14000																																			
14000 - 15000																																			
15000 - 20000	1																																	3	4
20000 - 25000	1																																		1
25000 - 30000																																		1	1
30000 - 35000																																		1	1
35000 - 40000																																			
40000 - 45000																																			
45000 - 50000																																		1	1
Over 50000	3																																	1	4
Totals	149	353	100	71	67	69	60	67	84	102	114	112	122	126	117	93	86	89	72	77	97	137	120	82	80	62	217	124	77	37	14	18	9	61	3265

Table IV

Personal Property to Real Estate

(1933)

Real Estate

Personal Property

	None	Under 500	500 - 1000	1000 - 1500	1500 - 2000	2000 - 2500	2500 - 3000	3000 - 3500	3500 - 4000	4000 - 4500	4500 - 5000	5000 - 5500	5500 - 6000	6000 - 6500	6500 - 7000	7000 - 7500	7500 - 8000	8000 - 8500	8500 - 9000	9000 - 9500	9500 - 10000	10000 - 11000	11000 - 12000	12000 - 13000	13000 - 14000	14000 - 15000	15000 - 20000	20000 - 25000	25000 - 30000	30000 - 35000	35000 - 40000	40000 - 45000	45000 - 50000	Over 50000	Totals
None		340	91	79	71	63	57	64	83	106	112	113	118	114	118	88	89	64	53	55	67	102	60	48	47	38	99	48	17	13	6	7	3	26	2459
Under 500	80			1	1		3	2	2			1	2	3	2	4	8	13	9	3	10	17	17	10	5	2	15	1	2	1				2	222
500 - 1000	25					1						1		1				6	17	8	22	18	22	11	7	8	26	17	10	3		3	1	2	209
1000 - 1500	17			1	1				1				1					1	1		1	8	21	14	18	16	32	17	4	8	4	4	2	2	171
1500 - 2000	11			1													1							1	2	6	19	13	6			1		1	62
2000 - 2500	2							1																			26	17	6	4	4	4		1	65
2500 - 3000	1																						1				1	5	3		1	1		1	14
3000 - 3500	4																			1						1		13	8	2		1		2	32
3500 - 4000	1				1																								5	1			1	1	10
4000 - 4500	1																												4	2		4		2	11
4500 - 5000																				1										1				1	3
5000 - 5500	1																														1	1	1	2	6
5500 - 6000																												1						1	2
6000 - 6500	2													1																				2	5
6500 - 7000																																			
7000 - 7500	2																1																		3
7500 - 8000																																			
8000 - 8500	1																																		1
8500 - 9000																																			
9000 - 9500	1																																	2	3
9500 - 10000																																			
10000 - 11000	1																																	2	3
11000 - 12000																																		1	1
12000 - 13000	1																							1											2
13000 - 14000	1																																		1
14000 - 15000																								1											1
15000 - 20000																																		2	2
20000 - 25000	1																									1									2
25000 - 30000																																		1	1
30000 - 35000	1																																		1
35000 - 40000																																			
40000 - 45000																																			
45000 - 50000																																		1	1
Over 50000	3																																	1	1
Totals	157	340	91	82	74	64	60	67	86	106	112	115	121	119	120	92	99	84	80	68	100	145	121	86	79	71	218	138	66	35	14	23	8	56	3297

Frequency Tables

Land to Improvements

Table I

Land to Improvements

(1930)

Land

Improvements

	None	Under 500	500-1000	1000-1500	1500-2000	2000-2500	2500-3000	3000-3500	3500-4000	4000-4500	4500-5000	5000-5500	5500-6000	6000-6500	6500-7000	7000-7500	7500-8000	8000-8500	8500-9000	9000-9500	9500-10000	10000-11000	11000-12000	12000-13000	13000-14000	14000-15000	15000-20000	20000-25000	25000-30000	30000-35000	35000-40000	40000-45000	45000-50000	Over 50000	Totals
None		792	227	127	108	60	58	49	19	22	11	17	9	9	4	6	5	2	5	3	1	7	1	4	2	6	8	5	2	1	1				1571
Under 500		56	5	2	3			1	1			1												1											70
500 - 1000		47	8	2	4			1	1						1																				64
1000 - 1500		36	4	2	2	2	1		1			1		1				1								1									52
1500 - 2000		42	12	5	7		1	1			1				1									1			1	1							73
2000 - 2500		39	15	9	6	2		1		1					2			1																	76
2500 - 3000		41	13	11	3	2	2					1						1			1						2								77
3000 - 3500		49	46	12	11	6	3	4	2	1	1	1	2		1												1								140
3500 - 4000		38	34	19	10	5	3				1		1	3	1									3		1									117
4000 - 4500		58	37	28	6	1	3	3	2	1		2	2							1				1		1	1	1							151
4500 - 5000		38	33	19	10	4		6			2											1													113
5000 - 5500		62	49	29	9	13	4	4	1	3	3	1	1	2								1													182
5500 - 6000		28	34	13	6	7		1	4		2						1																		96
6000 - 6500		49	42	10	7	8	2	1	3	2		3									1	1													137
6500 - 7000		26	26	18	6	2	2	6	1				2	1			1																		91
7000 - 7500		17	41	17	10	1	6	3	4	2	1	2	1			1																			106
7500 - 8000		8	26	16	8	6	3	3		1					1							1													73
8000 - 8500		13	40	37	13	12	4	4	5	1	1						2				1						1								134
8500 - 9000		6	20	25	10	9	1	2		1	2	1			1		1																		79
9000 - 9500		3	23	30	8	10	6	1			2			1		1		1					1					1								88
9500 - 10000		1	13	10	9	5	7	6		1		1	1					1	1	1																57
10000 - 11000		2	28	37	24	12	9	9	7	3	2	1	1	3				1	3				1	1			1	1								146
11000 - 12000			1	11	10	10	3	6	7	2	1	3		1				3							3		1									63
12000 - 13000			7	18	18	9	8	1	1	1	2	2	2	2						2								1		1					75
13000 - 14000			5	6	9	8	5	1		2		2		1		1	1						1		1		2									48
14000 - 15000			4	4	8	7	4	3	1	3	1		1	1	1	1																				39
15000 - 20000		1	3	14	19	21	19	20	9	9	3	3	8	4	2	1	1	1	3	6		3	2	4	3	1	1				1				162
20000-25000			1	3	7	7	17	6	6	1	3	2	1	1	1	1		2			2	1		1					1						67
25000 - 30000				2	1	3	2	7	6	3	2	1	2	1	2		2	1	2		1	2		1			3	1						1	1	50
30000 - 35000									3	2		2					1		1			3	1					2	3							18
35000 - 40000					1		1				1						1		1					1		1	3					1				91
40000 - 45000					1					2							1		1			1		1			2	1		1					11
45000 - 50000																1							1	1			1			1			1			6
Over 50000				1		1				2		1		1	2		1	1				2		3			5	1		3	2	1		8	35
Totals		1452	800	545	357	236	174	153	84	69	42	48	34	32	20	13	18	16	17	13	7	23	8	21	7	10	34	14	7	6	4	3	2	9	4228

Table II

Land to Improvements

(1931)

Land

Improvements

	None	Under 500	500 - 1000	1000 - 1500	1500 - 2000	2000 - 2500	2500 - 3000	3000 - 3500	3500 - 4000	4000 - 4500	4500 - 5000	5000 - 5500	5500 - 6000	6000 - 6500	6500 - 7000	7000 - 7500	7500 - 8000	8000 - 8500	8500 - 9000	9000 - 9500	9500 - 10000	10000 - 11000	11000 - 12000	12000 - 13000	13000 - 14000	14000 - 15000	15000 - 20000	20000 - 25000	25000 - 30000	30000 - 35000	35000 - 40000	40000 - 45000	45000 - 50000	Over 50000	Totals
None		784	232	135	112	57	61	49	20	17	11	17	8	10	5	8	3	2	4	3	1	6	3	4	4	3	11	5	2	1	1				1579
Under 500		49	6	3	3			1	1													1												64
500 - 1000		50	5	1	1																												60
1000 - 1500		35	5	4	1	1	1		1			1																						48
1500 - 2000		47	11	3	5	1		1																1			2							71
2000 - 2500		38	16	8	4	2	1	1		2	1		1		1						1			1										77
2500 - 3000		41	15	11	2	2	3				1	1						1			1						1							79
3000 - 3500		51	51	11	11	6	2	6	1	1	1	1	1		1																			144
3500 - 4000		35	33	17	11	5	1				1	1	1	2	2									1		1								114
4000 - 4500		58	35	28	9	2	5	1	1	2	1	1	2											1		1		1						148
4500 - 5000		38	33	23	9	5		7		1	2											1												119
5000 - 5500		57	50	25	8	12	3	5		2	4	1	1	2					1							1								172
5500 - 6000		29	31	20	8	9		2	4	1	2						1	1																108
6000 - 6500		44	55	13	8	9	2	1	2	2		3									1	1													141
6500 - 7000		33	36	22	5	2	3	1	2				1	1			1									1									111
7000 - 7500		13	48	20	9	1	5	3	3	2	1		1			1											1								108
7500 - 8000		11	28	18	9	6	3	3	1	1				1	1						1														83
8000 - 8500		10	40	39	14	10	1	3	4	1	2						2							1											130
8500 - 9000		5	20	25	10	9	2	2		1	2	1			1		1					1													80
9000 - 9500		4	26	30	10	11	6	1			1	2		1		1		1					1					1							96
9500 - 10000			15	9	9	5	7	5		2	1	2	1					1	1	1							1								60
10000 - 11000		2	28	43	26	11	9	9	3	3	1	3		3	1				2				1					1							146
11000 - 12000			2	14	9	12	3	6	9	2	1	3						2	1					1			1								66
12000 - 13000			9	16	20	10	8	1	1		2	3	2	3						2															77
13000 - 14000			5	6	8	6	7	3	2	3		2		1		1	1						1		1		2								49
14000 - 15000			5	4	11	8	4	3	1	3			2	1																					42
15000 - 20000			3	18	25	29	22	19	10	11	4	5	8	3	2	2	1	1	3	4		2	2	3	2	1	2				1				183
20000 - 25000			1	4	12	7	13	6	11	8	4	3	1	1	2	1		1			2	1						1					1		80
25000 - 30000				1	6	3	4	6	2	4	1	1	2	2	2		2	1	1		1	1		1			2	1					1		45
30000 - 35000							1	1	2		1	2			1		1		2	1		2	1				2	2	3						22
35000 - 40000					1		1										2					1		1		1	2					1			10
40000 - 45000									1	2							1		2			1		1			2	1		1			1		13
45000 - 50000								1							1		1						1				1			1					6
Over 50000				1		1				1					2		2	2				2		3	1		5			3	2	1		7	33
Totals		1434	844	572	379	242	184	150	81	72	45	53	32	31	22	14	19	13	17	11	8	20	10	18	9	9	34	13	6	6	4	2	2	8	4364

Table III

Land to Improvements

(1932)

Land

Improvements

	None	Under 500	500-1000	1000-1500	1500-2000	2000-2500	2500-3000	3000-3500	3500-4000	4000-4500	4500-5000	5000-5500	5500-6000	6000-6500	6500-7000	7000-7500	7500-8000	8000-8500	8500-9000	9000-9500	9500-10000	10000-11000	11000-12000	12000-13000	13000-14000	14000-15000	15000-20000	20000-25000	25000-30000	30000-35000	35000-40000	40000-45000	45000-50000	Over 50000	Totals
None		865	258	155	110	66	63	43	20	17	11	11	7	12	5	7	4	2	5	2	1	5	4	1	2	2	11	6	2	2	1				1700
Under 500		50	4	2	3			3														1		1											64
500 - 1000		42	11	2	4				1																										60
1000 - 1500		42	6	4	1		1	1	1			2																							58
1500 - 2000		48	9	2	5	1		1																		2									68
2000 - 2500		40	17	6	3	2		1		1	1				2						1														74
2500 - 3000		41	15	12	3	3	3					1									1					1									85
3000 - 3500		52	51	14	9	6	2	4	2	2	1		2		1																				146
3500 - 4000		34	30	17	12	6	4		1		1		1	3	1									1		1									112
4000 - 4500		58	37	28	6	1	4	1	1	2		1	2											1		1		1							144
4500 - 5000		41	34	23	11	4		7	1	1	3														1										126
5000 - 5500		59	51	28	11	13	4	5		2	3	2	1	1					1						1										182
5500 - 6000		33	32	19	4	9		1	3	1	2	1					1																		110
6000 - 6500		50	60	17	1	1	1	2	1	2		3			1						1														152
6500 - 7000		29	34	23	4	3	2	3	2				1	1		1						1														106
7000 - 7500		21	50	20	8	2	6	5	1	1	1		1	1		1											2								122
7500 - 8000		6	31	14	9	5	4	2	3	2		1			1						1														79
8000 - 8500		11	50	38	16	10	4	2	2	1	1					1	2																		138
8500 - 9000		6	22	29	10	10	2	3		1	2	1			1								1												88
9000 - 9500		4	32	27	13	12	5	2		2	3	1		1			1		1									1							105
9500 - 10000			16	8	4	5	8	1		2		1	1							1															55
10000 - 11000		2	33	44	27	13	10	9	2	3		2	1	3	1				1	1			1				1								154
11000 - 12000			1	14	9	13	1	1	12	2	1	4			1			3	1						1		1								80
12000 - 13000			12	19	21	11	8	1	1	1	2	2	2	3						1															84
13000 - 14000			6	10	4	6	8	1	1	1	2			1		1							1		1		1				1				55
14000 - 15000		1	3	7	11	8	6	1	1	3			2	1																					47
15000 - 20000		1	3	19	24	34	22	21	11	11	1	6	8	3	2	2	2	1	2	4		1	2	4	1	1	1								190
20000 - 25000			1	1	7	11	19	5	12	7	1	3	1	1	1	1	2	1			1	1		2	1		2		3						90
25000 - 30000				2	3	3	3	7	2	3	2	2	2	1	2		1	1	1		1	2		4			3	1		1	1					46
30000 - 35000								1	1	1	1	1	2			1		1		2	1		2	1			2	2	1					1	21
35000 - 40000						1	1	1								1		2		2			1		1		1					1			13
40000 - 45000										1	2									1			1				2	1		1					10
45000 - 50000									1								1						1				2			1			1		7
Over 50000					1		1				1					2		2	1				2		2	1		1	1		3	2	1		5	31
Totals		1536	915	608	374	266	195	151	85	75	45	46	32	34	23	14	19	9	17	10	7	17	11	15	9	6	35	16	6	8	4	2	1	6	4597

Table IV

Land to Improvements

(1933)

Land

Improvements

	None	Under 500	500-1000	1000-1500	1500-2000	2000-2500	2500-3000	3000-3500	3500-4000	4000-4500	4500-5000	5000-5500	5500-6000	6000-6500	6500-7000	7000-7500	7500-8000	8000-8500	8500-9000	9000-9500	9500-10000	10000-11000	11000-12000	12000-13000	13000-14000	14000-15000	15000-20000	20000-25000	25000-30000	30000-35000	35000-40000	40000-45000	45000-50000	Over 50000	Totals
None		872	246	155	113	57	58	43	19	17	13	10	10	10	4	8	5	1	4	1	1	3	4	1	1	1	9	5	3	2	1				1677
Under 500		50	6	1	4		1	2														1						1							66
500-1000		49	13	2	2						1																							67
1000-1500		44	7	5	2							1														1								61
1500-2000		50	9	3	4	1																				1								68
2000-2500		41	14	6	3	3		1		2	1		1		2																			74
2500-3000		42	15	8	4	3	2		1		1	2	1		1							1				1								82
3000-3500		53	52	19	10	7	1	3	2	1	2	1	2		1									1	1		1							157
3500-4000		35	33	18	10	6	4	1			1		2	2											1									113
4000-4500		59	37	29	7	1	4	1	2	3			2						1					1		1								148
4500-5000		41	36	23	12	4		5	1	1	1														1									125
5000-5500		64	53	28	11	11	4	5	1	1	3	2	1	1		1			1								1							188
5500-6000		32	31	21	6	8	1	2	3	1	2					1		1																109
6000-6500		54	63	10	7	5	1	1	2	1	2	1			1										1									157
6500-7000		27	39	27	5	5	3	1	2				1	1		1						1													113
7000-7500		14	56	20	10	3	6	5	2	2	1		1			1											1								122
7500-8000		5	32	19	11	6	6	2		1		2			1			1	1								1								88
8000-8500		10	50	40	16	11	1	1	2	1	1	1					2			1															139
8500-9000		4	24	29	10	11	2	3	1	1	1	1										1													88
9000-9500		3	38	28	11	12	8	2		2	3	1	1	1	1		1										1	1							114
9500-10000			16	9	11	5	5	5		2		2																							55
10000-11000		4	33	46	22	17	12	7	2	3		3		3	2					2								1	1						158
11000-12000			10	18	11	10	1	9	12	3	2	3						1	1				1				1								86
12000-13000			12	20	20	11	6	1	1	2	2	1	1							1															82
13000-14000			6	7	11	8	8	2	1	3	1	2	1									1			1					1				55
14000-15000			5	12	10	6	3	1	3	3		1	2	1										1											51
15000-20000			2	16	22	38	25	22	11	16	2	3	7	3	6	2		1	2	1		2		3	1	1	1								184
20000-25000			1	5	6	14	20	8	12	7	5	3	2	1	1	1	2	2			1	1					2		1	1				1	97
25000-30000				1	8	1	2	7	1	3	1	2	3	2	2		2	2		1	1	1	1			1	3	1	1						41
30000-35000							1	2	2	2	1	2			1		3		1			2	1	1			2	2	1	1					25
35000-40000						1	1	1										1	2			1					1	2				1			11
40000-45000									1	2									2			1		1			2						1		10
45000-50000								1			1						1										1							1	6
Over 50000						1				1				1	1		2	1				2		3	2		4	2	1	2	2	1		5	31
Totals		1553	939	631	374	266	193	149	84	77	48	43	38	28	24	16	18	11	15	10	3	18	7	11	8	6	34	16	8	6	4	2	1	7	4568

Averages

The following averages have been computed from the frequency tables: Personal Property to Real Estate and Land to Improvements. They are included for the reader's use as he wishes. Where they have been used in arriving at conclusions, reference has been made. Definitions for these terms may be found in the Introduction.(1)

In computing the averages for Personal Property, only the frequencies from the class intervals, "Under 500", through the class, "9,500 - 10,000", were used. Concentration being found in the lower limits, it was felt that to include those items over $10,000 would too greatly affect the results.

The averages for: Real Estate, Land, and Improvements were computed from the frequencies for the class intervals "Under 500" through "45,000 - 50,000". The two indeterminate classes, "None", and, "Over 50,000", have to be excluded from all computations.

These same two indeterminate, however, may be very significant. In fact, one of the most important conclusions in this study was computed using the "None" classification for non-personalty real estate owners.

---

(1) Confer ante, Pages 8 to 11.

AVERAGES FOR 1930

Personal Property

Mean	$1316
Median	974
Mode	730
Quartiles	
1st	478
3rd	1686

Real Estate

Mean	$8510
Median	6453
Mode	250
Quartiles	
1st	2921
3rd	11274

AVERAGES FOR 1931

Personal Property

Mean	$1281
Median	945
Mode	Bimodal
Quartiles	
1st	473
3rd	1643

Real Estate

Mean	$8898
Median	6842
Mode	250
Quartiles	
1st	3267
3rd	11675

AVERAGES FOR 1932

Personal Property

Mean	$1210
Median	949
Mode	250
Quartiles	
1st	453
3rd	1625

Real Estate

Mean	$8797
Median	6842
Mode	250
Quartiles	
1st	3328
3rd	11642

AVERAGES FOR 1933

Personal Property

Mean	$1256
Median	950
Mode	250
Quartiles	
1st	462
3rd	1625

Real Estate

Mean	$8866
Median	6940
Mode	250
Quartiles	
1st	3450
3rd	11733

AVERAGES FOR 1930

Land

Mean	$2009
Median	827
Mode	250
Quartiles	
1st	368
3rd	2103

Improvements

Mean	$8259
Median	6458
Mode	5230
Quartiles	
1st	3997
3rd	10210

AVERAGES FOR 1931

Land

Mean	$1974
Median	941
Mode	250
Quartiles	
1st	380
3rd	2080

Improvements

Mean	$8446
Median	6642
Mode	5238
Quartiles	
1st	4106
3rd	10355

ACREAGE FOR 1951

Land

Mean	$1274
Median	941
Mode	850
Quartiles	
1st	850
3rd	1080

Improvements

Mean	$6442
Median	6642
Mode	8238
Quartiles	
1st	4108
3rd	10258

AVERAGES FOR 1932

Land

Mean	$1910
Median	915
Mode	250
Quartiles	
1st	374
3rd	2020

Improvements

Mean	$8519
Median	6771
Mode	5233
Quartiles	
1st	4190
3rd	10528

AVERAGES FOR 1932

Land

Mean	$1210
Median	918
Mode	850
Quartiles	
1st	874
3rd	2080

Improvements

Mean	$2819
Median	2771
Mode	2225
Quartiles	
1st	1750
3rd	10328

AVERAGES FOR 1933

Land

Mean	$1865
Median	909
Mode	250
Quartiles	
1st	374
3rd	1979

Improvements

Mean	$8457
Median	6746
Mode	5233
Quartiles	
1st	4160
3rd	10454

AVERAGES FOR 1933

Land

Mean	$1863
Median	909
Mode	580
Quartiles	
1st	274
3rd	1979

Improvements

Mean	$6407
Median	2742
Mode	5233
Quartiles	
1st	4190
3rd	10474

CORRELATION

CORRELATIONS FOR 1933[1]

Personal to Land and Improvements

Coefficient of Correlation	0.3681
Probable Error	0.02286

Land to Improvements

Coefficient of Correlation	0.5036
Probable Error	0.00924

---

(1) Because of the marked similarity of the frequencies in both sets of tables, it was unnecessary to work the coefficient of correlation for more than one year. However, 1933 was selected as being the latest in point of time, not because it was more representative of the series but because it brings the study closer to the present.

CORRELATIONS FOR 1923 (1)

Personal to Land and Improvements

Coefficient of Correlation	0.3821
Probable Error	0.09286

Land to Improvements

Coefficient of Correlation	0.8036
Probable Error	0.00234

---

(1) Because of the marked similarity of the frequencies in both sets of tables, it was unnecessary to work the coefficient of correlation for more than one year. However, 1923 was selected as being the latest in point of time, but because it was more representative of the certain that because it brings the study closer to the present.

SOURCES OF REVENUE

AND

DISTRIBUTION OF REVENUES

TABLE I

SOURCES OF REVENUE

Item	1930	1933
Commonwealth Income Tax prior to May 1	$ 5,304.00	
Commonwealth Income Tax	118,781.00	$ 55,580.00
Commonwealth Corporation Tax	26,273.29	15,989.72
Commonwealth Bank Tax		3,752.12
National Bank Tax	5,234.77	
Trust Company Tax	5,497.09	
Departmental Receipts	20,234.39	22,402.21
Moth Tax	136.02	48.37
Street Betterment Tax	2,452.43	7,868.55
Sewer Betterment Tax	6,593.93	3,642.07
Sewer Department	31,182.13	15,488.47
Motor Vehicle Excise Tax	45,205.89	30,687.97
Surplus Voted to be Used	25,000.00	
Assessment on Polls	6,224.00	6,910.00
Assessment on Personal Estate	59,661.32	62,955.44
Assessment on Real Estate	723,823.98	780,653.29
Refund on Washington Street Bridge	2,056.86	438.34
Refund on Metropolitan Boulevard		220.95
Old Age Assistance Tax		3,474.00
Aiding Mothers		603.02
Emergency Finance Board Allotment		3,106.09
Contributions from Town Officers and Employees		29,790.00
State Aid		250.00
Deficiency	9,660.07	
Totals	$1,093,321.17	$1,043,860.61

TABLE I

SOURCES OF REVENUE

Item	1950	1952
Commonwealth Income Tax		
Year to May 1	$ 6,304.00	
Commonwealth Income Tax	116,761.00	$ 65,880.00
Commonwealth Corporation Tax	20,975.20	16,989.72
Commonwealth Bank Tax		3,762.12
National Bank Tax	8,224.77	
Trust Company Tax	5,407.09	
Departmental Receipts	20,234.39	29,402.21
Moth Tax	136.02	42.37
Street Betterment Tax	8,482.42	7,868.55
Sewer Betterment Tax	6,895.35	3,842.07
Sewer Department	21,182.13	16,482.47
Motor Vehicle Excise Tax	42,208.39	30,807.97
Surplus Voted to be Used	28,000.00	
Assessment on Polls	8,224.00	6,810.00
Assessment on Personal Estate	89,681.32	82,958.44
Assessment on Real Estate	725,922.38	780,682.29
Refund on Washington Street Bridge	8,088.88	432.34
Refund on Metropolitan Boulevard		220.85
Old Age Assistance Tax		3,474.00
Aiding Mothers		808.02
Emergency Finance Board Allotment		3,108.09
Contributions from Town Officers and Employees		29,760.00
State Aid		880.00
Deficiency	9,000.07	
Totals	$1,088,821.37	$1,043,860.81

TABLE II

DISTRIBUTION OF REVENUES

Item	1930	1933
Town Appropriations	$ 860,795.55	$ 745,230.37
Bonded Debt	105,500.00	127,000.00
State Tax	28,560.00	43,740.00
South Metropolitan Sewer Tax	18,536.12	27,494.61
Charles River Basin Tax	4,007.22	3,055.16
Metropolitan Parks Tax	22,398.50	14,228.28
Metropolitan Planning Tax	155.73	132.40
Lighting Plants	43.12	13.98
State Highway Tax	309.29	
Southern Route, Metropolitan	171.11	
Veteran's Exemptions	58.52	139.15
Old Age Assistance Tax		3,474.00
Malden Ways	715.26	7.56
West Roxbury Parkway		1,823.15
Norfolk County Tax	35,315.48	26,126.87
Overlay, 1930	9,930.46	
Canterbury Street Highway		207.23
Revere Beach Parkway		404.40
Sewer Betterment Tax	6,593.93	3,642.07
Overlay, 1932		4,000.00
Special State Sewerage Assessment	163.00	
State Snow Removal Tax	67.88	
Deficit of 1932		10,000.00
Discounted Interest on notes not included in appropriation		3,000.00
Overlay, 1933		20,007.29
Ocean Avenue, Revere		408.62
Bank Tax Refund		39.52
Excess		9,685.95
Totals	$1,093,321.17	$1,043,860.61

TABLE II

DISTRIBUTION OF REVENUES

VALUATIONS, APPROPRIATIONS, AND DEBT

AND

RATIO OF ASSESSMENT AND TAX RATE

TABLE I

VALUATIONS, APPROPRIATIONS, AND DEBT
(1921-1933)

Year	Taxable Valuation	Appropriations	Total Net Debt December 1	Ratio of Debt to Valuation
1921	$19,120,295.00	$ 361,107.75	$ 452,000.00	2.36
1922	20,155,900.00	402,781.16	516,500.00	2.56
1923	22,074,725.00	435,197.19	719,000.00	3.25
1924	25,014,225.00	534,329.00	964,500.00	3.85
1925	27,384,250.00	606,930.00	1,039,000.00	3.73
1926	29,844,700.00	629,271.38	1,095,500.00	3.67
1927	31,135,250.00	866,344.61	1,218,000.00	3.91
1928	32,940,245.00	961,637.63	1,271,500.00	3.85
1929	34,388,125.00	961,674.69	1,332,000.00	3.87
1930	36,440,955.00	1,061,373.32	1,347,000.00	3.69
1931	37,636,370.00	989,291.60	1,425,000.00	3.78
1932	38,671,770.00	752,616.20	1,363,000.00	3.52
1933	38,697,410.00	838,262.69	1,236,000.00	3.19

TABLE I

VALUATIONS, APPROPRIATIONS, AND DEBT
(1921-1932)

Year	Taxable Valuation	Appropriations	Total Net Debt December 31	Ratio of Debt to Valuation
1921	$19,120,896.00	$ 361,107.75	$ 492,000.00	2.56
1922	20,158,900.00	402,781.16	518,800.00	2.66
1923	22,074,725.00	455,197.19	718,000.00	3.25
1924	26,014,225.00	554,330.00	964,500.00	3.65
1925	27,354,280.00	806,930.00	1,039,000.00	3.73
1926	29,344,700.00	839,271.39	1,095,500.00	3.67
1927	31,185,550.00	856,344.61	1,218,000.00	3.91
1928	32,940,216.00	961,857.83	1,271,600.00	3.86
1929	34,586,128.00	981,674.69	1,352,000.00	3.87
1930	36,440,955.00	1,061,373.32	1,347,000.00	3.69
1931	37,655,270.00	989,291.80	1,425,000.00	3.78
1932	38,671,770.00	782,814.80	1,463,000.00	3.82
1933	38,897,410.00	858,285.69	1,456,000.00	3.79

TABLE II

RATIO OF ASSESSMENT AND TAX RATE
(1921-1933)

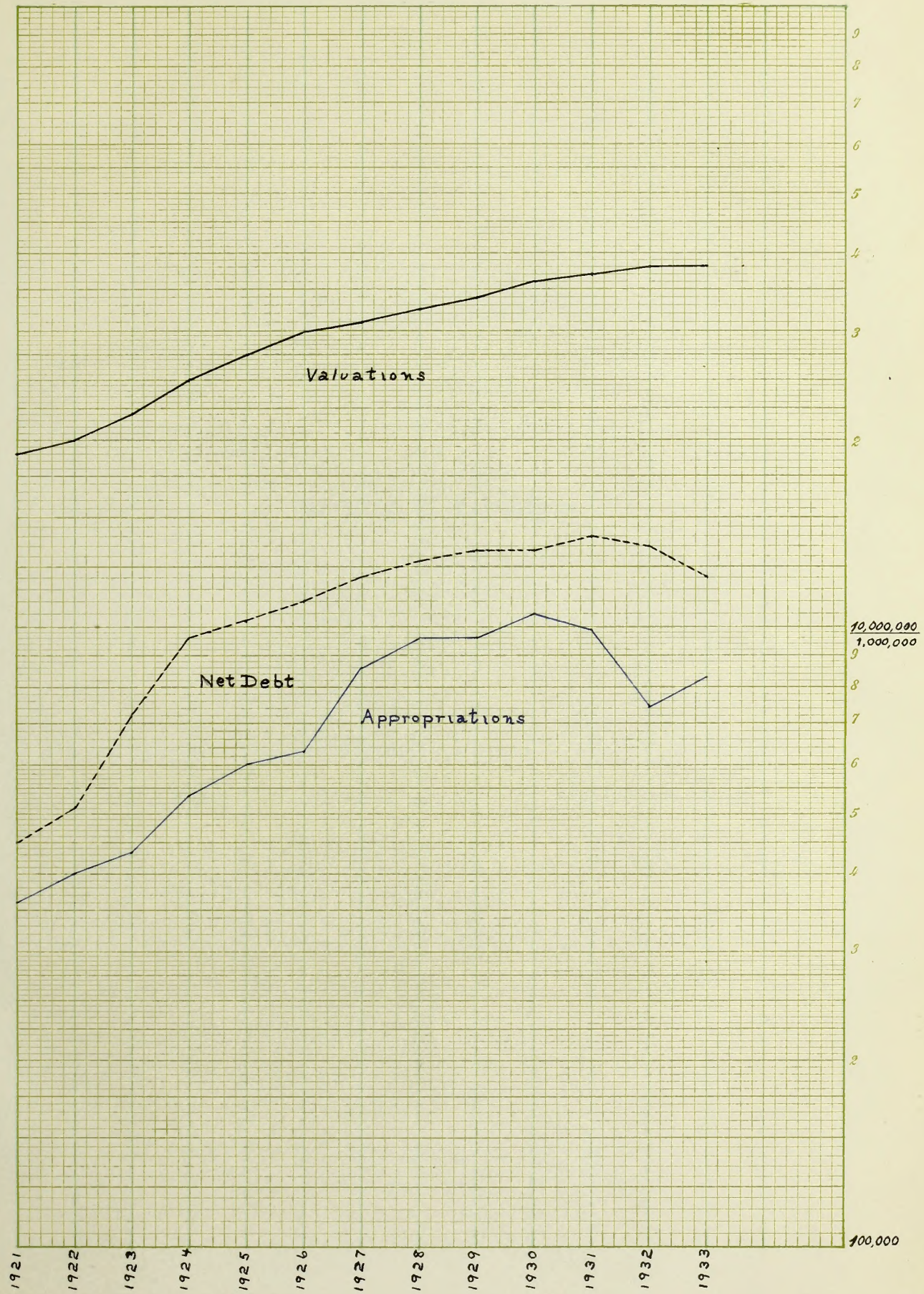
Year	Tax Rate	Ratio of Assessment	Tax Rate at 70% Ratio
1921	$ 18.50	100	$ 26.40
1922	20.00	100	28.60
1923	20.50	100	29.30
1924	22.00	100	31.40
1925	25.00	100	35.70
1926	21.00	100	30.00
1927	22.50	100	32.10
1928	23.70	100	33.80
1929	20.00	100	28.60
1930	21.50	100	30.70
1931	21.00	100	30.00
1932	20.50	100	29.30
1933	21.80	100	31.10

TABLE II

RATIO OF ASSESSMENT AND TAX RATE
(1921-1932)

Year	Tax Rate	Ratio of Assessment	Tax Rate at 70% Ratio
1921	$ 14.30	100	$ 25.40
1922	20.00	100	28.60
1923	20.80	100	29.80
1924	28.00	100	31.40
1925	28.00	100	35.70
1926	21.00	100	30.00
1927	22.80	100	32.10
1928	23.70	100	33.80
1929	20.00	100	28.50
1930	21.50	100	30.70
1931	21.00	100	30.00
1932	20.50	100	29.20
1933	21.30	100	31.10

Figure I
Valuations, Appropriations, and Debt
(1921-1933)



DETAILS OF VALUATION

TABLE I

DETAILS OF VALUATION(1)
(1905-1933)

Year	Buildings	Land	Personal	Total	Personal to Total
1905	$3,716,200	$3,769,255	$4,438,684	$11,924,139	37.2%
1906	3,933,075	3,927,140	4,730,950	12,591,165	37.5
1907	4,154,425	3,998,790	5,393,725	13,546,940	39.8
1908	4,277,425	4,031,575	5,309,875	13,618,875	38.9
1909	4,446,000	4,052,310	5,468,775	13,967,085	39.1
1910	4,702,200	4,112,225	6,295,666	15,110,091	41.6
1911	5,017,875	4,206,987	7,910,238	17,135,145	46.1
1912	5,468,125	4,231,025	7,767,449	17,364,474	44.7
1913	5,927,375	4,387,932	7,787,725	18,103,032	43.02
1914	6,679,000	4,521,100	8,234,797	19,434,897	42.3
1915	6,919,975	4,546,857	9,389,933	20,856,765	45.02
1916	7,377,822	4,686,460	9,581,152	21,645,438	44.2
* 1917	7,932,705	4,776,040	1,775,339	14,484,084	12.2
1918	8,160,630	5,093,847	1,960,459	15,214,936	12.8
1919	8,738,950	5,555,425	2,205,226	16,499,601	13.3
1920	10,420,650	5,618,900	2,112,810	18,152,360	11.6
1921	11,126,675	5,666,500	2,327,120	19,120,295	12.1
1922	11,584,600	5,691,950	2,609,350	20,155,900	12.9
1923	13,320,500	6,550,500	2,698,725	22,074,725	12.2
1924	15,352,200	6,649,175	3,012,850	25,014,225	12.04
1925	17,237,575	7,550,675	3,046,000	27,834,250	10.9
1926	18,963,450	7,862,925	3,018,325	29,844,700	10.1
1927	20,036,200	7,855,550	3,243,500	31,135,250	10.4
1928	21,524,825	8,134,120	5,281,300	32,940,245	16.03
1929	23,252,850	8,558,775	2,636,275	34,447,900	7.6
1930	24,622,000	9,044,030	2,744,925	36,440,955	7.6
1931	25,667,950	9,118,245	2,850,175	37,636,370	7.5
1932	26,742,075	9,043,845	2,885,850	38,671,770	7.4
1933	26,836,950	8,972,610	2,887,850	38,697,410	7.4

(1) and * -- First year of operation of law on incomes and intangibles; notice decrease in personal property valuation.

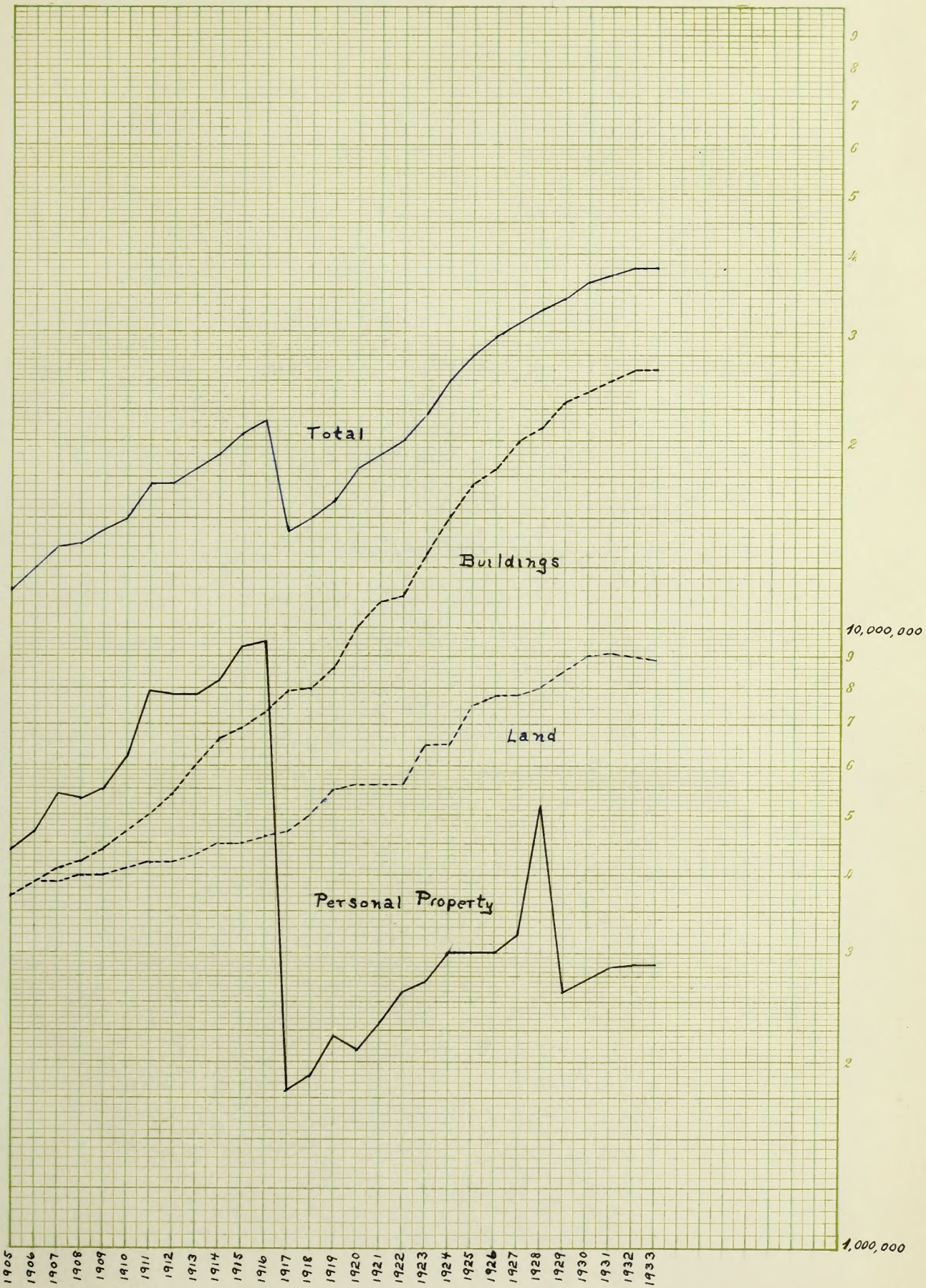
TABLE I

DETAILS OF VALUATION (1)
(1908-1932)

Year	Buildings	Land	Personal	Total	Personal to Total
1908	$5,713,200	$5,753,256	$4,458,684	$11,924,154	37.3%
1909	5,932,078	5,897,140	4,780,980	12,321,168	37.8
1910	6,154,428	6,099,780	5,885,728	13,646,940	39.8
1911	6,277,458	6,021,376	6,239,675	13,618,876	38.9
1912	6,446,000	6,082,710	6,468,375	13,967,085	39.1
1913	6,702,800	6,118,286	6,898,866	15,110,091	41.6
1914	6,934,378	7,210,287	7,910,278	17,138,143	46.1
1915	7,468,128	7,281,038	7,784,449	17,384,474	44.7
1916	8,027,376	8,887,432	7,787,728	18,102,052	43.02
1917	6,979,000	8,851,100	8,254,727	19,484,827	42.3
1918	8,918,078	8,840,827	9,389,933	20,980,758	46.02
1919	7,577,028	9,988,400	9,881,182	21,842,458	44.2
1920	7,839,708	9,770,040	7,778,339	19,484,084	12.3
1921	8,780,880	8,003,847	1,980,489	18,814,936	12.8
1922	8,758,980	8,885,425	8,208,222	18,460,601	13.3
1923	10,420,880	8,618,000	8,118,810	18,132,309	11.6
1924	11,128,878	8,867,800	8,327,130	18,128,308	12.1
1925	11,884,600	8,601,380	8,309,380	20,185,900	12.8
1926	13,380,500	8,880,000	8,308,728	20,074,728	12.9
1927	15,328,200	8,849,178	8,012,850	20,014,228	12.04
1928	17,237,878	7,880,878	8,048,000	27,854,250	10.8
1929	18,963,650	7,883,828	8,018,328	28,844,700	10.1
1930	20,038,200	7,858,850	8,248,800	31,138,250	10.4
1931	21,884,088	8,134,180	8,281,800	32,940,248	10.02
1932	25,328,880	8,858,178	8,858,278	34,447,800	7.8
1933	24,822,000	8,048,080	8,744,928	36,440,958	7.8
1934	26,887,980	8,118,248	8,880,178	37,888,370	7.8
1935	26,748,078	8,048,848	8,885,880	38,871,770	7.4
1936	28,838,980	8,878,818	8,887,880	38,887,410	7.4

(1) and * -- First year of operation of law on income and intangible ratios decrease in personal property valuation.

Figure I
Details of Valuation
(1905-1933)



PART III

CONCLUSIONS

PART III

CONCLUSIONS

Correlation of Personal Property to Real Estate

When this study was started, it was hoped that some definite conclusion could be drawn from the correlation of personal property to real estate. However, as has been stated before, a coefficient of correlation must be at least 0.5 to have any significance.(1) A correlation of 0.3681 is obviously too low to use, and resort must be made to other statistical criteria.

Although the coefficient of correlation, 0.3681, is of little or no significance, it must be stated that it is much higher than anticipated. Knowing that little taxable personal property is ever assessed, a correlation of 0.02 would not have been surprising. Reference might be made to a similar study in Lowell, Massachusetts by Miss Louise Haffner. In this study of one of the largest industrial cities in the state, a correlation coefficient of 0.09 was found. Obviously, 0.09 is more as one might expect to find the situation; and one might well ask what should cause the difference between Lowell and Wellesley.(2)

---

(1) Confer ante, Page 11.
(2) Miss Louise E. Haffner, PROBLEMS IN PROPERTY VALUATION, (LOWELL), Unpublished Master's Thesis, Page 44.

If one will but consider the type of property in each of these places, he will readily understand. Lowell is highly industrial and possesses a high percentage of low-valued property. There is, therefore, a concentration of frequencies in the lower intervals on both scales of the table. It is hardly to be expected that employees in a mill city should be possessed of much personal property. Consequently, their holdings which make up the great bulk of Lowell's property tend to lower the correlation. Wellesley, on the other hand, is almost entirely residential and contains a large proportion of medium and high-valued property. Taking 1933, for example, we find that 62.5 per cent of all the real estate is valued above $5,000; and it may be stated fairly that we should expect to find a comparatively high assessment of personalty against real estate of this order. Looking at the table, Personal Property to Real Estate, for 1933, the concentration of Personal Property from "Under 500" to "4,000-4,500" and the concentration of Real Estate from "5,000-5,500" to "45,000-50,000" bears out this conclusion.(1)

---

(1) Confer ante, Page 19.

Although the correlation is not high enough to have a definite significance, we may draw a conclusion from the comparison of Lowell and Wellesley. Cities industrial in nature such as: Lowell, Lawrence, Brockton, and Marlborough will probably have little or no correlation between personalty and real estate. Cities and towns largely residential in make-up such as: Wellesley, Brookline, Newton, and Milton will probably have a comparatively high correlation--though still low from the taxpayer's viewpoint.

Correlation of Land to Improvements

When the relationship of land to improvements is analyzed, a truly significant correlation is discovered. Taking 1933 again, the coefficient of correlation for land to improvements is 0.5036. From this figure, it is possible to draw one conclusion with a fair degree of certainty.

From the figures analyzed, it appears that in 50 per cent of the cases high improvement values are associated with high land values. Stated in other terms: the more valuable pieces of land have been used for improvements proportionately of the same degree of value. As we progress along the scale of land

values, we descend along the scale for improvements in 50 per cent of the instances.

It stands to reason that the association is hardly one of chance. An owner of land valued at $10,000 is not going to build a shack on that land worth $300 when a piece of land worth $200 will do just as well. The opposite is just as true: one would hardly build a $50,000 home on a piece of land worth $200 when selected sites at $3,000 can be purchased. This association is true--at least in 50 out of 100 cases.

Another relationship between land and improvements is that of unimproved land to total. Taking 1933 for example, the ratio is found to be 36.08 per cent. From this figure it would appear that Wellesley has an opportunity to grow for some time to come. This ratio has remained constant for the four years of the study though the total frequency has increased. Probably the reason for it is that improvements have been built on sites cut out of large parcels of land. The result is obvious: improvements and total frequency increase without lowering the ratio.

Loss of Revenue from Personalty Valuation

Although the statements above are of some importance in showing relationships, they do not give a definite picture. We have nothing in any of these figures, upon which we can take a stand one way or another. However, using three ratios derived from this study, it is safe to conclude that personal property assessments should either be abandoned or assessors should get at this added source of municipal revenue.

If the reader will turn to the table, Personal Property to Real Estate, for 1933, the following discussion may have more significance.(1)

It will be noticed that concentration of the frequencies for Personal Property lies between "Under 500" and "4,000-4,500". On the other scale of the table, Real Estate, concentration appears between "5,000-5,500" and "45,000-50,000". The class interval "Over 50,000" must be excluded because of its indeterminate character. Using these frequencies, it is found that the mean for Personal Property is $1,230

---

(1) Confer ante, Page 19.

and for Real Estate $17,125. The ratio of Personal Property to Real Estate is 0.07. We may assume therefore that 7 per cent is a fair estimate of the amount of personalty which a real estate owner should possess whose holdings are above $5,000 in value.

Another figure for the same ratio is found in the right of assessors to arbitrarily levy 10 per cent against real estate of a property owner. Where a real estate owner files no listing of his personal property, the town assessors can add 10 per cent of the real estate valuation as an arbitrary value of his personalty--a legal right of which little use is made as shown by the large group of non-personal property holders.

Using a third method, 14 per cent is the figure derived from the same ratio.(1) The mean for Personal Property is $1,256 and the mean for Real Estate is $8,866. Expressed as a percentage of Personal Property to Real Estate these means give the figure above (14 per cent).

Taking the frequencies for those real estate owners who pay no personal property tax, multiplying

---

(1) Confer ante, Page 30.

the respective frequencies by the midpoint of its class interval, and summating the results, an approximation of the total value of this property is reached. The method outlined above gives a value for this real estate, which is free from personal property assessment, of $14,176,250. By using the three ratios found above, it appears that the town of Wellesley is losing a considerable figure of taxable personal property.

Loss of Valuation

7 per cent average for concentration frequencies	$ 992,338.00
10 per cent legally assessable	1,417,625.00
14 per cent ratio of means	1,984,675.00

Loss of Revenue
(1933 Tax Rate)

7 per cent average for concentration frequencies	$21,625.60
10 per cent legally assessable	30,912.40
14 per cent ratio of means	43,273.00

It makes no difference which figure we choose, the fact remains that this revenue is worth seeking. To be conservative, the results obtained from the 7 per cent ratio are probably more reasonable.

Inequitable Distribution of Tax Burden

By analysis of the frequencies for Personal Property to Real Estate for 1933, the inequitable feature of the tax is quite clearly shown.(1)

Recapitulation of Personal to Real Estate
(1933)

Total Items	3297	
No Personal: Real Estate	2459	
No Personal: Real Estate to Total		74.5%
No Real Estate: Personal	157	
No Real Estate: Personal to Total		4.7
Personal and Real Estate	681	
Personal and Real Estate to Total		20.8
Totals	3297	100.0%

Obviously, some of those included in No Personal: Real Estate may be among those in No Real Estate: Personal as tenants. As such they would tend to affect the results shown on page 54, since the total of the property and the use of the three ratios presupposes the fact that no personal property can be checked against the real estate involved. Tenants who pay personal property taxes would have a tendency to move personalty-free Real Estate into the Personal and Real Estate classification. For our purposes, however, the results are sufficiently accurate.

(1) Confer ante, Page 19.

Inequitable Distribution of Tax Burden

By analysis of the frequencies for Personal Property to Real Estate for 1952, the inequitable feature of the tax is quite clearly shown.(1)

Reclassification of Personal to Real Estate
(1952)

No Personal: Real Estate	2429	
No Personal: Real Estate to Total		76.5%
No Real Estate: Personal	187	
No Real Estate: Personal to Total		4.7%
Personal and Real Estate	601	
Personal and Real Estate to Total		20.8%
Totals	3297	100.0%

Obviously, some of those included in No Personal: Real Estate may be among those in No Real Estate: Personal as counted. As such they would tend to affect the results shown on page 84, since the total of the property and the use of the three tables appropriate the fact that no personal property can be checked against the real estate involved. Persons who pay personal property taxes would have a tendency to move personality-free Real Estate into the Personal and Real Estate classification. For our purposes, however, the results are sufficiently accurate.

(1) Cooley study, Page 15.

One figure from the table above to which attention should be called is: No Real Estate: Personal. In a town of 11,427, there are only 157 persons owning no real estate who pay personal property taxes. Does the figure not seem ridiculously low? From the taxpayer's viewpoint, it is greatly out of line; and here is a source of municipal revenue which has scarcely been touched.

Restatement

Why should the conscientious real estate owner who lists his personalty and pays his taxes on that property or the personal property owner who owns no real estate but pays taxes on his personalty suffer this inequitable condition because of the large percentage of real estate holders who declare no personal property? The condition should not exist and it could be remedied. Let real estate bear the entire burden, or tax real estate and personal property assessing personalty at a more nearly true valuation.

BIBLIOGRAPHY

BIBLIOGRAPHY

Town Reports of Wellesley, Massachusetts for the Years: 1930, 1931, 1932, and 1933.

President Hoover's Research Committee on Social Trends. Recent Social Trends. McGraw-Hill Book Company, Inc. New York and London. 1933.

Fairchild, Fred R.; Furniss, Edgar S.; and Buck, Norman S. Elementary Economics. The Macmillan Company. 1930

Sutcliffe, William G., Elementary Statistical Methods. The McGraw-Hill Book Company, Inc. New York and London. 1925.

* 352.1
D89
Cop. 1

* 352.1
D89

Dumont

Tax problems in a New England community

DATE	ISSUED TO
4 45	Fred Wing

6/3/3b

BOSTON UNIVERSITY
1 1719 02544 1736